

REMARKS

Applicant respectfully requests reconsideration of the present application in view of the foregoing amendments and in view of the reasons that follow. After amending the claims as set forth above, claims 1-3 and 5-11 are now pending in this application.

Applicant wishes to thank the Examiner for the careful consideration given to the claims.

Information Disclosure Statement

Applicant submitted an Information Disclosure Statement on June 20, 2007. Applicant respectfully request that the Examiner consider, initial, and sign the IDS, and return a copy of the initialed and signed IDS with the next office communication.

Rejection of claims 1-2, 5-7, and 9-11 under 35 U.S.C. 102

Claims 1-2, 5-7, and 9-11 are rejected under 35 U.S.C. 102(b) as being anticipated by JP 09-231990 ("Fujii"). For at least the following reasons, this rejection is traversed.

Claim 1 (as amended) recites, among other things, a fuel cell system comprising: a fuel cell; a circulating pump; an ion exchange resin filter; an electric conductivity meter; a circulating flow path including the fuel cell, the circulating pump, the ion exchange resin filter and the electric conductivity meter; and a judgment part. The judgment part judges whether replacement of the ion exchange resin filter is needed based on a comparison between a predetermined reference electric conductivity and an electric conductivity of water circulating in the circulating flow path that is measured by the electric conductivity meter. The measurement of the electric conductivity of water circulating in the circulating flow path is scheduled at a predetermined time after a start of water circulation according to an initial electric conductivity of water circulating in the circulating flow path and an estimated time as the electric conductivity of water circulating in the circulating flow path asymptotically approaches a steady state value.

According to the invention of claim 1, an ion-exchange capacity is accurately evaluated by measuring the electric conductivity before the electric conductivity converges to a steady-state value without performing a continuous measurement of the electric conductivity. (Page 6, lines 11-23 of the specification.) Thus, it is possible to judge when an ion exchange resin filter needs to be replaced in advance of the elevation of the electric conductivity of water used in the fuel cell system and to prevent the fuel cell from being

degraded or damaged. (Page 2, lines 10-13 of the specification.) Fujii does not teach or suggest the combination of features of claim 1.

The operational method of the ion exchange water treatment device for a fuel cell of Fujii just monitors a current electric conductivity and judges it is time to replace the ion exchange resin cylinders 27A-27C with new ones when the current electric conductivity exceeds a predetermined level. Using this configuration of Fujii, it is difficult to accurately estimate an ion-exchange capacity of the ion exchange resin filter because the electric conductivity is measured at a time after the electric conductivity converges to a steady-state value. As a result, the system of Fujii is quite different from the system of claim 1.

Regarding the wording of “determined time” in claim 1, the PTO asserts that “[i]t is noted that the claimed determined time is when the electric conductivity exceeds such a level; this time having been decided before operation of the fuel cell” (Paragraph 3 of the Office Action)(emphasis added). This understanding appears to be based on the machine translation of the abstract of Fujii in which it states: “[w]hen the electric conductivity exceeds a predetermined fixed level, it is judged that the silica concentration in the treated water flowing in the last stage ion exchange resin cylinder 27D becomes high.” (Abstract of Fujii)(emphasis added). However, Fujii merely describes a successive (intermittent or continuous) measurement of the electric conductivity and monitoring when the electric conductivity reaches a predetermined fixed level. At no time does Fujii disclose that there is a measurement of electric conductivity of water scheduled at a predetermined time or that such a predetermined time is determined according to an initial electric conductivity of water and an estimated time as the electric conductivity of water asymptotically approaches a steady state value.

In contrast, according to the invention of claim 1, the measurement of the electric conductivity of water circulating in the circulating flow path is scheduled at a predetermined time after a start of water circulation according to (i) an estimated time as the electric conductivity of water circulating in the circulating flow path asymptotically approaches a steady state value as well as (ii) an initial electric conductivity of water circulating in the circulating flow path. (Page 4, line 9-page 5, line 5 of the specification). Thus, Fujii fails to teach or suggest the “predetermined time” of claim 1. Accordingly, Fujii does not teach or suggest all the features of claim 1, and the rejection should be withdrawn.

Claims 2, 5-7, and 11 depend from and contain all the features of claim 1, and are allowable therewith for at least the same reasons as claim 1, without regard to the further patentable features contained therein.

Claim 9 (as amended) recites, among other things, a method of controlling a circulating flow path of a fuel cell system comprising: starting a water circulation; determining a predetermined time for measuring the electric conductivity of water according to an initial electric conductivity of water circulating in the circulating flow path and an estimated time as the electric conductivity of water circulating in the circulating flow path asymptotically approaches a steady state value; and judging whether the ion exchange resin filter needs replacement based on a comparison between a predetermined reference and an electric conductivity of water circulating in the circulating flow path as measured by the electric conductivity meter at the predetermined time after the start of water circulation. As previously mentioned, Fujii does not teach or suggest determining a predetermined time for measuring the electric conductivity of water according to an initial electric conductivity of water and an estimated time as the electric conductivity of water asymptotically approaches a steady state value. Indeed, at no time does Fujii disclose that there is a measurement of electric conductivity of water scheduled at a predetermined time or that such a predetermined time is determined according to an initial electric conductivity of water and an estimated time as the electric conductivity of water asymptotically approaches a steady state value. Fujii merely describes a successive (intermittent or continuous) measurement of the electric conductivity and monitoring when the electric conductivity reaches a predetermined fixed level. Accordingly, Fujii does not teach or suggest all the features of claim 9.

Claim 10 (as amended) recites, among other things, a fuel cell system comprising: a circulating means for circulating water in a fuel cell; an ion-exchange means for exchanging ions in the circulating water; a circulating flow path including an electric conductivity measuring means, the fuel cell, the circulating means, and the ion-exchange means; and a judging means. The judging means judging whether the ion exchange means needs replacement based on a comparison between a predetermined reference and an electric conductivity of water circulating in the circulating flow path as measured by the electric conductivity measuring means. The measurement of the electric conductivity of water circulating in the circulating flow path is scheduled at a predetermined time after a start of water circulation according to an initial electric conductivity of water circulating in the circulating flow path and an estimated time as the electric conductivity of water circulating in

the circulating flow path asymptotically approaches a steady state value. As previously mentioned, Fujii does not teach or suggest that the measurement of the electric conductivity of water circulating in the circulating flow path is scheduled at a predetermined time after a start of water circulation according to an initial electric conductivity of water and an estimated time as the electric conductivity of water asymptotically approaches a steady state value. Indeed, at no time does Fujii disclose that there is a measurement of electric conductivity of water scheduled at a predetermined time or that such a predetermined time is determined according to an initial electric conductivity of water and an estimated time as the electric conductivity of water asymptotically approaches a steady state value. Fujii merely describes a successive (intermittent or continuous) measurement of the electric conductivity and monitoring when the electric conductivity reaches a predetermined fixed level. Accordingly, Fujii does not teach or suggest all the features of claim 10.

For at least these reasons, favorable reconsideration of the rejection is respectfully requested.

Rejection of claim 8 under 35 U.S.C. 103

Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fujii in view of U.S. Patent Application Publication 2004/0028963 ("Kormann"). The rejection is traversed for at least the following reasons.

Claim 8 depends from and contains all the features of claim 1. As previously mentioned, Fujii does not teach or suggest that the measurement of the electric conductivity of water circulating in the circulating flow path is scheduled at a predetermined time after a start of water circulation according to an initial electric conductivity of water circulating in the circulating flow path and an estimated time as the electric conductivity of water circulating in the circulating flow path asymptotically approaches a steady state value. Kormann does not cure these deficiencies.

Kormann discloses a device for deionizing cooling media for a fuel cell in which a direct voltage is supplied onto the electrodes of an electrode ionization cell 23 under the switching of a conductivity sensor 24 in order to reduce the electric conductivity in the cooling circuit 20 arranged downstream of the heat exchanger 22. The PTO asserts that Kormann teaches *a predetermined time* for changing an ion exchange filter in a fuel cell system after a certain operation time. However, Kormann merely describes a general fact that the ion exchanger will be exhausted sooner or later (i.e., after a certain operating time).

(Paragraph 0005 of Kormann.) There is nothing in Kormann to teach or suggest that the measurement of the electric conductivity of water is scheduled at a predetermined time after a start of water circulation according to an initial electric conductivity of water and an estimated time as the electric conductivity of water asymptotically approaches a steady state value (as recited in claim 1) or that the predetermined time is set to a period in which the water circulating in the circulating flow path circulates through the circulating flow path for a predetermined number of times (as recited in claim 8).

Because no combination of Fujii and Kormann teaches or suggests all the features of claim 1 and its dependent claim 8, claim 8 is allowable over the prior art.

For at least these reasons, favorable reconsideration of the rejection is respectfully requested.

Conclusion

Applicant believes that the present application is now in condition for allowance. Favorable reconsideration of the application as amended is respectfully requested.

The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 19-0741. Should no proper payment be enclosed herewith, as by a check or credit card payment form being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 19-0741. If any extensions of time are needed for timely acceptance of papers submitted herewith, Applicant hereby petitions for such extension under 37 C.F.R. §1.136 and authorizes payment of any such extensions fees to Deposit Account No. 19-0741.

Respectfully submitted,

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